

## ABSTRACT OF THE DISCLOSURE

In a process for the synthetic generation of methane from a feed gas mixture, a feed gas mixture including carbon monoxide, hydrogen, water vapor, CO<sub>2</sub>, volatile hydrocarbons comprising C<sub>2</sub> and higher, unsaturated C<sub>2</sub> components and aromatic hydrocarbons in the range of 1 to 10 vol% is provided. The feed gas mixture is contacted with a fluidized bed catalyst having catalyst particles having a catalytic active component selected from the group consisting of a metal, a metal compound and combinations thereof. The contacting occurs at an elevated temperature in the range of 250 to 450°C, a feed gas pressure in the range of 0.8 to 70 bar, a gas hourly space velocity of 1000 to 50000 h<sup>-1</sup>, and a concentration of H<sub>2</sub>/CO in the gas mixture in the range of 0.25 to 5.